

Package ‘cifti’

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Type Package

Title Toolbox for Connectivity Informatics Technology Initiative
(‘CIFTI’) Files

Version 0.4.5

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Description Functions for the input/output and visualization of
medical imaging data in the form of ‘CIFTI’ files
<<https://www.nitrc.org/projects/cifti/>>.

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Imports xml2, oro.nifti, gifti, utils, R.utils

Encoding UTF-8

LazyData true

RoxygenNote 6.0.1.9000

Suggests covr, knitr, rmarkdown, rgl, matrixStats

VignetteBuilder knitr

NeedsCompilation no

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cifti_brain_structs *Extract Brain Structures from CIFTI Brain Models*

Description

Extracts the BrainStructure attribute from a BrainModel in a cifti object

Usage

```
cifti_brain_structs(file)
```

Arguments

file cifti object

Value

A vector of brain structure names

cifti_coords_gifti *Map CIFTI values to Coordinates using GIFTI*

Description

Maps the data portion of CIFTI data set from a Brain Model to the xyz coordinate triangles

Usage

```
cifti_coords_gifti(file, gii_file, structure, add_one = TRUE)
```

Arguments

file filename of CIFTI file or cifti object
gii_file filename of corresponding GIFTI file or gifti object
structure Structure to map, must be one of the brain models in the CIFTI
add_one should 1 be added to indices (1-based vs. 0-based)

Value

List of coordinates and values

cifti_data	<i>Extract CIFTI data from file</i>
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Description

Extracts the data after the CIFTI XML information

Usage

```
cifti_data(fname, nim = NULL)
```

Arguments

fname	Filename of CIFTI
nim	NIfTI-2 header, if already parsed. If NULL, nifti_2_hdr will be run on the CIFTI.

Value

Array of values

cifti_read_char	<i>Read characters with embedded nulls</i>
-----------------	--

Description

Simple wrapper for reading in character values with embedded nulls in a binary file

Usage

```
cifti_read_char(fid, n, to = "UTF-8")
```

Arguments

fid	identifier of the open file connection
n	number of elements to read
to	A character string describing the target encoding.

Value

Character vector

cifti_xml_txt	<i>Extract CIFTI XML</i>
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Description

Extracts CIFTI XML from the CIFTI file

Usage

```
cifti_xml_txt(fname, nim = NULL)
```

```
cifti_xml(...)
```

Arguments

fname	filename of CIFTI
nim	NIfTI-2 header, if already parsed. If NULL, nifti_2_hdr will be run on the CIFTI.
...	arguments to pass to cifti_xml

Value

Character string of XML information

download_cifti_data	<i>Download CIFTI Test Data</i>
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Description

Downloads CIFTI test data from https://www.nitrc.org/frs/download.php/8541/cifti-2_test_data-1.2.zip

Usage

```
download_cifti_data(outdir = system.file(package = "cifti"),
  overwrite = FALSE, ...)
```

Arguments

outdir	Output directory for test file directory
overwrite	Should files be overwritten if already exist?
...	additional arguments to download.file

Value

Vector of file names

get_cifti_type	<i>Get Generic CIFTI Type</i>
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Description

Wrapper for multiple types of CIFTI XML types.

Usage

```
get_cifti_type(fname, type = c("Volume", "Surface", "Parcel", "NamedMap",  
"BrainModel"))
```

```
cifti_as_list(fname, type = c("Volume", "Surface", "Parcel", "NamedMap",  
"BrainModel"))
```

Arguments

fname	File name of CIFTI file
type	type of data to extract from CIFTI XML

Value

List of output from each type

have_cifti_test_data	<i>Check Presence of CIFTI Test Data</i>
----------------------	--

Description

Checks if CIFTI test data is downloaded

Usage

```
have_cifti_test_data(outdir = system.file(package = "cifti"))
```

Arguments

outdir	Output directory for test file directory
--------	--

Value

Logical indicator

`is.cifti`*Test if CIFTI*

Description

Simple wrapper to determine if class is CIFTI

Usage

```
is.cifti(x)
```

Arguments

x object to test

Value

Logical if x is CIFTI

`is_cifti_numeric`*Test of numeric CIFTI field*

Description

Wrapper of CIFTI fields for easy logical test

Usage

```
is_cifti_numeric(x)
```

Arguments

x character vector of names

Value

Logical of length same as x

matrix_ind_map_nodes *Extract MatrixIndicesMap nodes from CIFTI*

Description

Extracts the nodes from a CIFTI-2 file corresponding to the MatrixIndicesMap branch

Usage

```
matrix_ind_map_nodes(fname)
```

Arguments

fname File of CIFTI data

Value

Nodes of class xml_noderset

nifti_2_hdr *Read Nifti-2 Header*

Description

Reads a Nifti-2 header from a filename

Usage

```
nifti_2_hdr(fname, verbose = FALSE, warn = -1)
```

Arguments

fname Filename
verbose Print diagnostic messages
warn Should warnings be printed? Passed to [options](#)

Value

Object of class nifti

Note

The unused_str part of the header is not returned, but is an empty string of 15 characters. This code was adapted by the oro.nifti package

parse_brain_model *Parse BrainModel from CIFTI*

Description

Extracts information about BrainModels from CIFTI file

Usage

```
parse_brain_model(nodeset)
```

```
get_brain_model(fname)
```

Arguments

nodeset Set of XML nodes corresponding to BrainModel

fname filename of CIFTI file

Value

List of values

Examples

```
## Not run:  
doc = cifti_xml(fname)  
nodes = xml_find_all(doc, "/CIFTI/Matrix/MatrixIndicesMap")  
nodeset = xml_find_all(nodes, "./BrainModel")  
  
## End(Not run)
```

parse_named_map *Parse Named Map from CIFTI*

Description

Extracts information about Named Maps from CIFTI file

Usage

```
parse_named_map(nodeset)
```

```
get_named_map(fname)
```


Arguments

nodeset Set of XML nodes corresponding to NamedMap
fname filename of CIFTI file

Value

List of values

Examples

```
## Not run:  
doc = cifti_xml(fname)  
nodes = xml_find_all(doc, "/CIFTI/Matrix/MatrixIndicesMap")  
nodeset = xml_find_all(nodes, "./NamedMap")  
parse_named_map(nodeset)  
  
## End(Not run)
```

parse_parcel	<i>Parse Parcel from CIFTI</i>
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Description

Extracts information about Parcels from CIFTI file

Usage

```
parse_parcel(nodeset)  
  
get_parcel(fname)
```

Arguments

nodeset Set of XML nodes corresponding to Parcel
fname filename of CIFTI file

Value

List of values

parse_surface	<i>Parse Surface from CIFTI</i>
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Description

Extracts information about Surfaces from CIFTI file

Usage

```
parse_surface(nodeset)
```

```
get_surface(fname)
```

Arguments

nodeset	Set of XML nodes corresponding to Surface
fname	filename of CIFTI file

Value

List of values

Examples

```
## Not run:  
doc = cifti_xml(fname)  
nodes = xml_find_all(doc, "/CIFTI/Matrix/MatrixIndicesMap")  
nodeset = xml_find_all(nodes, "./Surface")  
parse_volume(nodeset)  
  
## End(Not run)
```

parse_volume	<i>Parse Volume from CIFTI</i>
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Description

Extracts information about Volumes from CIFTI file

Usage

```
parse_volume(nodeset)
```

```
get_volume(fname)
```

Arguments

nodeset Set of XML nodes corresponding to Volume
 fname filename of CIFTI file

Value

List of values

Examples

```
## Not run:
doc = cifti_xml(fname)
nodes = xml_find_all(doc, "/CIFTI/Matrix/MatrixIndicesMap")
nodeset = xml_find_all(nodes, "./Volume")
parse_volume(nodeset)

## End(Not run)
```

 read_cifti

Read CIFTI File

Description

Reads CIFTI Files

Usage

```
read_cifti(fname, drop_data = TRUE, trans_data = TRUE)
```

```
readCIFTI(fname, drop_data = TRUE, trans_data = TRUE)
```

```
readcii(fname, drop_data = TRUE, trans_data = TRUE)
```

Arguments

fname file name of CIFTI file
 drop_data Should the empty data dimensions be dropped?
 trans_data Should the data be transposed

Value

List of information from the CIFTI file

Examples

```
outdir = tempdir()
if (have_cifti_test_data(outdir = outdir)) {
  files = download_cifti_data(outdir = outdir)
  fname = grep("MyelinAndCorrThickness.32k_fs_LR.dscalar",
  files, value = TRUE)
  res = read_cifti(fname)
}
```

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